

AMENDMENT

(Amendment Based on Article 11)

To: The Examiner of the Japanese Patent Office

1. Identification of the International Application

PCT/JP03/08332

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4. Item to be amended: Claims

5. Contents of Amendment:

- (1) The expression "a mold whose cavity is designed to set the shrinkage ratio of said resin molded article into a range of between 4.5/1000 and 6.6/1000," on page 37 line 6 in Claim 1 should be amended as "a mold whose cavity is designed to set X direction, Y direction, and Z direction molding shrinkage ratios of said resin molded article to be the same value each into a range of between 4.5/1000 and 6.6/1000,".
- (2) The expression "a mold whose cavity is designed to set the shrinkage ratio of said resin molded article into a range of between 4.5/1000 and 6.7/1000," on page 37 line 17 in Claim 2 should be amended as "a mold whose cavity is designed to set X direction, Y direction, and Z direction molding shrinkage ratios of said resin molded article to be the same value each into a range of between 4.5/1000

[Table 2]

Resin = ABS Table 2-1		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = ABS Table 2-2		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = ABS Table 2-3		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = ABS Table 2-4		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.5

Resin = ABS Table 2-5		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = ABS Table 2-6		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.0

Resin = ABS Table 2-7		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Resin = ABS Table 2-8		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = ABS Table 2-9		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = ABS Table 2-10		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = ABS Table 2-11		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = ABS Table 2-12		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	45
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

{Table 3}

Resin = HIPS		Table 3-1
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS		Table 3-2
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS		Table 3-3
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.7

Resin = HIPS		Table 3-4
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = HIPS		Table 3-5
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = HIPS		Table 3-6
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS		Table 3-7
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = HIPS		Table 3-8
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = HIPS		Table 3-9
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS		Table 3-10
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = HIPS		Table 3-11
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = HIPS		Table 3-12
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	38
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = modified PPE Table 4-1			Resin = modified PPE Table 4-2			Resin = modified PPE Table 4-3		
Item	Unit	Value in Practice	Item	Unit	Value in Practice	Item	Unit	Value in Practice
The temperature of the melted resin	°C	180	The temperature of the melted resin	°C	230	The temperature of the melted resin	°C	265
The temperature of the mold	°C	45	The temperature of the mold	°C	45	The temperature of the mold	°C	45
Injection pressure	%	70	Injection pressure	%	70	Injection pressure	%	70
Injection speed	%	70	Injection speed	%	70	Injection speed	%	70
Cooling time of the inside of the mold	sec	15	Cooling time of the inside of the mold	sec	15	Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25	Gas pressure	Mpa	25	Gas pressure	Mpa	25
Gas injection position	Cavity		Gas injection position	Cavity		Gas injection position	Cavity	
Molding Shrinkage ratio (X.Y.Z)	%	5.5	Molding Shrinkage ratio (X.Y.Z)	%	5.8	Molding Shrinkage ratio (X.Y.Z)	%	6.4

Resin = modified PPE Table 4-4			Resin = modified PPE Table 4-5			Resin = modified PPE Table 4-6		
Item	Unit	Value in Practice	Item	Unit	Value in Practice	Item	Unit	Value in Practice
The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245
The temperature of the mold	°C	15	The temperature of the mold	°C	35	The temperature of the mold	°C	65
Injection pressure	%	70	Injection pressure	%	70	Injection pressure	%	70
Injection speed	%	70	Injection speed	%	70	Injection speed	%	70
Cooling time of the inside of the mold	sec	15	Cooling time of the inside of the mold	sec	15	Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25	Gas pressure	Mpa	25	Gas pressure	Mpa	25
Gas injection position	Cavity		Gas injection position	Cavity		Gas injection position	Cavity	
Molding Shrinkage ratio (X.Y.Z)	%	5.5	Molding Shrinkage ratio (X.Y.Z)	%	5.7	Molding Shrinkage ratio (X.Y.Z)	%	6.1

Resin = modified PPE Table 4-7			Resin = modified PPE Table 4-8			Resin = modified PPE Table 4-9		
Item	Unit	Value in Practice	Item	Unit	Value in Practice	Item	Unit	Value in Practice
The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245
The temperature of the mold	°C	35	The temperature of the mold	°C	35	The temperature of the mold	°C	35
Injection pressure	%	70	Injection pressure	%	70	Injection pressure	%	70
Injection speed	%	70	Injection speed	%	70	Injection speed	%	70
Cooling time of the inside of the mold	sec	15	Cooling time of the inside of the mold	sec	45	Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25	Gas pressure	Mpa	25	Gas pressure	Mpa	25
Gas injection position	Cavity		Gas injection position	Cavity		Gas injection position	Cavity	
Molding Shrinkage ratio (X.Y.Z)	%	6.5	Molding Shrinkage ratio (X.Y.Z)	%	5.8	Molding Shrinkage ratio (X.Y.Z)	%	5.6

Resin = modified PPE Table 4-10			Resin = modified PPE Table 4-11			Resin = modified PPE Table 4-12		
Item	Unit	Value in Practice	Item	Unit	Value in Practice	Item	Unit	Value in Practice
The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245	The temperature of the melted resin	°C	245
The temperature of the mold	°C	35	The temperature of the mold	°C	35	The temperature of the mold	°C	35
Injection pressure	%	70	Injection pressure	%	70	Injection pressure	%	70
Injection speed	%	70	Injection speed	%	70	Injection speed	%	70
Cooling time of the inside of the mold	sec	45	Cooling time of the inside of the mold	sec	45	Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10	Gas pressure	Mpa	25	Gas pressure	Mpa	40
Gas injection position	Cavity		Gas injection position	Cavity		Gas injection position	Cavity	
Molding Shrinkage ratio (X.Y.Z)	%	5.6	Molding Shrinkage ratio (X.Y.Z)	%	5.6	Molding Shrinkage ratio (X.Y.Z)	%	5.6

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (% V/V)	%	6.8

Item	Unit	Value in Practice
The temperature of the molten resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio $\alpha \times 10^{-3}$	%	7.0

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio $\alpha \times \gamma_0$	%	7.3

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio	%	6.7

Item	Unit	Value in Practice
The temperature of the molched resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (CV Z ₂)	%	6.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio of $\text{PC} + \text{Zr}$	%	7.3

Unit	Value in Practice
The temperature of the melted resin	210
The temperature of the mold	35
Injection pressure	99
Injection speed	99
Cooling time of the inside of the mold	90
Molding Shrinkage ratio ($\Delta V/V_0$)	7.3

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	180
Molding Shrinkage ratio (ΔV/V ₂)	%	7.1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	360
Molding Shrinkage ratio (X Y Z)	%	6.6

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	4.5
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (°C V. 2)	%	6.9

Item	Unit	Value in Practice
Temperature of the melted resin	°C	230
Temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (°C × 2)	%	7.0

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X Y Z)	%	7.3

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (V.V.2)	%	6.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding shrinkage ratio (2 × V ₂ /V ₁)	%	6.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X Y Z)	%	7.2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.3

Resin = HIPS		Table 6-17
Foaming agent = Sodium hydrogen carbonate		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	180
Molding Shrinkage ratio (X Y Z)	%	7.0

Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the finished of the mold	sec	360
Molding Shrinkage ratio (X,Y,Z)	%	6.7

[Table 8]

Resin = AES
Foaming agent = AC

Table 8-1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.9

Resin = AES
Foaming agent = AC

Table 8-2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Resin = AES
Foaming agent = AC

Table 8-3

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.0

Resin = AES
Foaming agent = AC

Table 8-4

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.7

Resin = AES
Foaming agent = AC

Table 8-5

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	6.8

Resin = AES
Foaming agent = AC

Table 8-6

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	65
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.1

Resin = AES
Foaming agent = AC

Table 8-7

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	90
Molding Shrinkage ratio (X,Y,Z)	%	7.3

Resin = AES
Foaming agent = AC

Table 8-8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	180
Molding Shrinkage ratio (X,Y,Z)	%	7.0

Resin = AES
Foaming agent = AC

Table 8-9

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	35
Injection pressure	%	99
Injection speed	%	99
Cooling time of the inside of the mold	sec	360
Molding Shrinkage ratio (X,Y,Z)	%	6.8

[Table 9]

Resin = ABS		Table 9-1	
Item	Unit	Value in Practice	
The temprature	°C	230	
The temprature	°C	45	
Injection presssure	%	70	
Injection speed	%	70	
Holding presssure	%	25	
Holding time	sec	3	
Cooling time	sec	25	
Molding Shrinkage ratio	X axis direction	%	5.2 to 5.4
	Y axis direction	%	5.3 to 5.6
	Z axis direction	%	6.2 to 6.9

Resin = modified PPE		Table 9-2	
Item	Unit	Value in Practice	
The temprature	°C	210	
The temprature	°C	45	
Injection presssure	%	70	
Injection speed	%	70	
Holding presssure	%	25	
Holding time	sec	3	
Cooling time	sec	25	
Molding Shrinkage ratio	X axis direction	%	5.4 to 5.8
	Y axis direction	%	5.2 to 5.5
	Z axis direction	%	6.1 to 6.9

Resin = HIPS		Table 9-3	
Item	Unit	Value in Practice	
The temprature	°C	240	
The temprature	°C	45	
Injection presssure	%	70	
Injection speed	%	70	
Holding presssure	%	25	
Holding time	sec	3	
Cooling time	sec	25	
Molding Shrinkage ratio	X axis direction	%	5.4 to 5.7
	Y axis direction	%	5.3 to 5.5
	Z axis direction	%	6.2 to 7.0

Resin = PC/ABS		Table 9-4	
Item	Unit	Value in Practice	
The temprature	°C	230	
The temprature	°C	45	
Injection presssure	%	70	
Injection speed	%	70	
Holding presssure	%	25	
Holding time	sec	3	
Cooling time	sec	25	
Molding Shrinkage ratio	X axis direction	%	5.0 to 5.3
	Y axis direction	%	4.9 to 5.1
	Z axis direction	%	5.6 to 6.5

[Table 10]

Resin = PC/ABS Table 10-1		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.1

Resin = PC/ABS Table 10-2		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PC/ABS Table 10-3		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Resin = PC/ABS Table 10-4		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	15
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.4

Resin = PC/ABS Table 10-5		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = PC/ABS Table 10-6		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	65
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = PC/ABS Table 10-7		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = PC/ABS Table 10-8		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PC/ABS Table 10-9		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	120
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = PC/ABS Table 10-10		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	10
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PC/ABS Table 10-11		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = PC/ABS Table 10-12		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	210
The temperature of the mold	°C	35
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	45
Gas pressure	Mpa	38
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

[Table 11]

Resin = ABS Table 11-1		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = ABS Table 11-2		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Resin = ABS Table 11-3		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS Table 11-4		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS Table 11-5		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.2

Resin = HIPS Table 11-6		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.9

Resin = modified PPE Table 11-7		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = modified PPE Table 11-8		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.8

Resin = modified PPE Table 11-9		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.4

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio ($\Delta X/Y \Delta$)	%	5.2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (ΔX/X ₀)	%	5.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	2.5
Gas injection position		Cavity
Molding Shrinkage ratio (X Y Z)	%	6.3

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	MPa	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio $\frac{1}{4} \times V_2/V_1$	%	5.1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z)	%	5.9

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	2.5
Gas Injection position		Cavity
Molding Shrinkage ratio (X Y Z)	%	6.2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding shrinkage ratio	%	5.2

Item	Unit	Value in Practice
Temperature of the melted resin	°C	230
Temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio	%	
5.8%		5.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection pressure		
Molding shrinkage ratio	%	6.1
°C/2A		

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio ΔV/V₀, %	%	5.1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	MPa	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	MPa	25
Gas injection position		Cavity
Molding Shrinkage ratio	%	6.2
ΔV/V ₂		

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio $\epsilon \times V, \%$	%	6.9

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio ($\lambda \times Y, Z$)	%	5.1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X,Y,Z,%)	%	6.1

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	2.5
Gas injection position		Cavity
Molding Shrinkage ratio ΔX/Y,Z	%	6.8

Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X V Z)	%	5.2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position		Cavity
Molding Shrinkage ratio (X Y, Z)	%	6.2

Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	7.0

[Table 13]

Resin = PPE modified HIPS
in which St-g-B is added

Table 13-1

Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.5

Resin = PPE modified HIPS
in which St-e-B is added

Table 13-2

Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PPE modified HIPS
in which St-e-B is added

Table 13-3

Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = PPE modified HIPS
in which St-g-E is added

Table 13-4

Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = PPE modified HIPS
in which St-e-E is added

Table 13-5

Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = PPE modified HIPS
in which St-e-E is added

Table 13-6

Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.6

Resin = PPE modified HIPS in which
Perprene P-150B is added

Table 13-7

Item	Unit	Value in Practice
The temperature of the melting resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.4

Resin = PPE modified HIPS in
which

Table 13-8

Item	Unit	Value in Practice
The temperature of the melting resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.6

Resin = PPE modified HIPS in
which

Table 13-9

Item	Unit	Value in Practice
The temperature of the melting resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.6

[Table 14]

Resin = ABS		
Table 14-1		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.2

Resin = HIPS		
Table 14-4		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	180
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.1

Resin = ABS		
Table 14-2		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	5.7

Resin = HIPS		
Table 14-5		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	230
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.3

Resin = ABS		
Table 14-3		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.3

Resin = HIPS		
Table 14-6		
Item	Unit	Value in Practice
The temperature of the melted resin	°C	265
The temperature of the mold	°C	45
Injection pressure	%	70
Injection speed	%	70
Cooling time of the inside of the mold	sec	15
Gas pressure	Mpa	25
Gas injection position	Cavity	
Molding Shrinkage ratio (X,Y,Z)	%	6.8